



In-Situ Object Counting System



Technical Demonstration Summary Sheet ISOCS for FREE RELEASE (IFR)

THE NEED

The Idaho National Engineering and Environmental Laboratory (INEEL) is decontaminating and decommissioning (D&D) facilities no longer in use. As part of the decontamination process, the facility must be surveyed to determine if any radiological contamination remains above the 'free release' criteria. To do this, a statistical grid is marked off and personnel, using hand-held survey instruments, check the area for any remaining contamination. This baseline technology survey process is tedious and labor intensive. A more cost effective survey methodology is needed for both characterization and final release phases.

THE TECHNOLOGY

The ISOCS for free release (IFR) is simply an in-situ gamma spectroscopy system that has been mathematically calibrated to perform a variety of efficiency calculations for a wide variety of shapes, sizes, densities, and distances between the detector and the area of interest. The IFR used for this demonstration at the INEEL was Canberra's In Situ Object Counting System (ISOCS) with the following components, 55% efficiency germanium detector with a portable liquid nitrogen cryostat (a 7 day Big Mac (Dewar)), battery or AC powered InSpector (a portable spectroscopy analyzer), adjustable collimator (shield), laptop computer with Canberra's software (i.e., Genie-2000 and PROcount), and portable cart for holding the detector along with the associated shielding.

THE DEMONSTRATION

The IFR demonstration began in December 1999 and ended in August 2000. A large area survey was performed in December using the IFR on a room at the Central Facilities Area (CFA-617) and compared against baseline technology. The IFR was set up by one technician in about 30 minutes at the beginning of the day and required only minutes to move to various locations in the area. Three laundry dryers were also surveyed as part of this demonstration. Validation testing was performed in the same facility in August 2000. During the validation testing, diffuse large area cesium-137 sources were strategically placed in various locations in the room to verify the IFR technology's capability to identify and locate contamination. Extended delays were experienced between the large area survey and the validation testing due to life cycle maintenance of the equipment, conflicts with the vendors and operators schedules, software issues, and safety considerations at the INEEL unrelated to this technology.

THE RESULTS

The IFR survey of the large area was completed in 10 hours, while it took a radiation technician with a handheld detector 40 hours to survey the same area. The IFR technology required only one hour to survey the three dryers and found elevated cobalt contamination on a door, while it took 25 hours for the baseline technology to hand survey and locate this same hot spot. The IFR accurately identified the areas where the large area dispersed sources were located and accurately identified the isotopes.

BENEFITS

- Provides in-situ, near 'real-time' analytical data, including isotopic results
- 79% reduction in labor hours for whole room survey
- No hand surveys necessary to satisfy 'free release' criteria
- Reduces risk of human error
- Reduces worker fatigue and stress

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Hand Survey of Room



IN-SITU OBJECT COUNTING SYSTEM
[HTTP://ID.INEL.GOV/LSDDP](http://id.inel.gov/LSDDP)

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